

## NEW SPECIES OF LEPIDOSTOMA

(Trichoptera: Lepidostomatidae)

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The six new species of *Lepidostoma* described herein will increase the total number of named species known to occur in the United States and Canada to about 40. Slightly over half of the described species are found only in western Canada and United States. As is usual in the *Lepidostoma* several of these new species possess some remarkable secondary sexual modifications. Unless indicated otherwise, types are deposited in the writer's collection.

## PLUVIALE GROUP

One of the new species described, *errigena*, is a member of the Pluviale group. The combination of characters setting off this group from all others are described.

The Pluviale group is characterized as follows: all males have the entire costal cell reflexed, the anterior portion is very wide and the resultant pocket is lined with scales. The distribution of scales are usually heaviest along the margin of the reflexed portion. The claspers, long and slender throughout, do not terminate in an acute point; the baso-dorsal lobe originating at base of clasper is single, lacking completely a ventro-lateral lobe; this lobe is of variable size, but always digitate. The small mesal lobe present at the apex of the clasper is of variable size, but always small and acute. The aedeagus bears a dorsal pair of acuminate rods arising from near base and generally following the contour of the structure. The first antennal segment is long and slender but not particularly modified; the maxillary palpi are modified into an apparent single segment, generally small, closely appressed to the head and bearing a dense brush of scales. Legs or spurs not modified.

Characters for differentiating the species are largely confined to the tenth tergite, and is largely based on the structure of a spur arising from the lateral or apical margin.

Sexual dimorphism is most pronounced in the reflexed condition of the wing, and as Ross (1946) has pointed out, it is not limited only to this group. However, no other group has a combination of all the above characters and none possess such a wide reflexed pocket. Reflexed portions of the subcostal cell from a mere pocket to three-fourths the length of the cell occurs in several species not related to the Pluviale group.

The new species, *errigena*, will increase the members ascribed to this group to nine. When a series of several species from various sections of the country was studied it was found that a wide range of variations existed and suggest that with larger series our concept

of some of the species may change. It is entirely probable that when larger series of *pluviale*, *rayneri*, *veleda*, and *ormea* are studied we will find that only one highly variable species is involved.

#### *Lepidostoma errigena* Denning, new species

This species, a member of the *pluvialis* group, is probably closest related to *aporna* Denning. The prominent dorsal lobe and the peculiar ventral spur will differentiate this species from others.

*Male*.—Length 7–8 mm. General color light brown. First antennal segment long and slender and bearing a dense brush of scales and setae along mesal margin. Maxillary palpi apparently one segmented, apex appressed against head and bearing a dense brush of dark brown scales. Front wings with entire costal cell reflexed, lined with dark brown scales.

*Genitalia* as in fig. 1. Tenth tergite widely separated on meson and thus divided into a pair of lateral lobes; ventral margin broadly rounded, the apico-ventral corner of ventral lobe produced into a ventrad directed spine and a caudad directed spine which may be bifid or single; dorsal spur prominent, slender and acute, reaching nearly to level of tergite; dorsal lobe not produced caudad. Clasper from lateral aspect typical of group—slender, long, basodorsal lobe digitate; from ventral aspect (fig. 1B) small acute process near apex along mesal margin. Aedeagus tubular, bearing a pair of long, closely appressed, very slender acuminate rods.

*Holotype* male, SEVEN OAKS, SANTA ANA RIVER, SAN BERNARDINO MTS., SAN BERNARDINO COUNTY, CALIFORNIA, July 8, 1950, John Belkin. Paratypes, two males, same data as for holotype; two males, Palomar Mt., San Diego County, July 12, 1946, 4700', C. P. Alexander. Holotype and one paratype deposited in the collection of the Academy of Science, San Francisco, California.

#### UNICOLOR GROUP

This group contains the largest number of described species. These species are quite variable but all possess the following characteristics. The clasper, while differing among the various species, is always short, and the baso-dorsal process is also short and usually pointed at the apex. The front wings have only a narrow reflexed area or only a small basal portion of the costal cell will be reflexed. Some of the most remarkable sexual modifications occur among the males of this group.

#### *Lepidostoma recina* Denning, new species

This species is a member of the *unicolor* group. It may be distinguished from other species by the ventral lobe of the tenth tergite.

*Male*.—Length 9 mm. Wings, legs and antennae light brown. Front

wings with reflexed cell wide but covering only about three-quarters of the costal cell, resultant pocket lined with brownish scales; along cubitus an infolding of the membrane produces a second distinct pocket in the wing. Maxillary palpi apparently one segmented, short and flattened, apical portion bearing a dense brush of bluish scales. First antennal segment long and slender, no secondary modifications.

*Genitalia* as in fig. 2. Tenth tergite as seen from dorsal aspect (fig. 2B), separated on meson only a short distance, apices of dorsal lobe sub-triangular, along dorso-mesal portion there is present a row of short protuberances just discernible, each bearing a short seta; along lateral margin there is a series of several prominent spines each bearing a short seta; ventral lobe produced caudad beyond remainder, truncate and serrate, lateral margin sinuate. Tenth tergite from lateral aspect (fig. 2A) with ventral margin arcuate, ventro-apical lobe produced caudad into a prominent lobe, the serrate margin directed dorso-caudad; dorsal lobe broadly rounded and bearing along dorsal and apical margin a series of prominent spines and protuberances each bearing a short seta. Clasper short, apex upturned and sub-acute; baso-dorsal lobe short and digitate, lateral lobe long, slender and acute; meso-apical surface bearing a short slender acute process projecting just to apex. Aedeagus short, arcuate, bearing no accessory structures.

*Holotype* male, Peavine Ridge, McMinnville, Oregon, June 29, 1950, K. M. Fender.

#### *Lepidostoma mira* Denning, new species

This species belongs to the *unicolor* group with distinguishing characters confined to the tenth tergite and the peculiar first antennal segment.

*Male*.—Length 8 mm. Wings, legs and antennae light brown. Maxillary palpi apparently one segmented, about two and one-half times length of head, distal two-thirds covered with a dense brush of scales and setae. First antennal segment about twice length of the head, mesal margin with a digitate projection producing a distinct incision (fig. 3B); lateral and mesal margin bearing a dense brush of dark brown setae. Basal portion of costal cell of front wing folded over to form a small pocket densely lined with dark brown scales, scattered brownish scales over remainder of wing.

*Genitalia* as in fig. 3. Dorsal lobes of tenth tergite, from dorsal aspect (fig. 3C) emarginate; ventral lobe projecting caudad and sub-acute apically. Tenth tergite from lateral aspect (fig. 3A) with a prominent quadrate spur along lateral surface of dorsal lobe, consisting of a dorsad and caudad directed apex; ventral lobe produced caudad beyond remainder, bearing a large spur near base of lobe and a small spur toward apex. Claspers short, constricted distally to a dorsad directed bifid apex; baso-dorsal lobe fairly slender, lateral lobe closely appressed to dorsal margin of clasper, slender and finger-like. Aedeagus bearing a pair of acuminate rods widely separated and closely appressed to structure.

*Female*.—Length 8 mm. Color, size and general structure same as for male. First antennal segment long, about two and one-half times length of head. Spermatheca as in fig. 3D.

*Holotype* male, STRAWBERRY, TUOLUMNE COUNTY, CALIFORNIA, July 8, 1951, E. L. Silver. *Allotype* female, same data as for holotype. Paratype males, 1 male, same data as for holotype; 1 male, Castle Lake, Siskiyou County, California, Harry Chandler. Holotype deposited in the collection of the University of California, Berkeley, California.

*Lepidostoma spicata* Denning, new species

This species is a member of the *unicolor* group. It may be distinguished from other *Lepidostoma* by the tenth tergite and the peculiar first and second segments of the antennae.

*Male*.—Length 9 mm. General color of wings, legs, antennae and body light brown. First antennal segment very large and bulbous, somewhat quadrate, postero-mesal portion somewhat flap-like with each segment approximate; second antennal segment (fig. 4C) with a flattened mesad directed arcuate process, the inner surface of semi-circle thus formed densely lined with short blackish setae. Maxillary palpi apparently one segmented, projected above head, apices flattened, mesal surface grooved and convergent, lateral and ventral margins clothed with long brownish setae.

*Genitalia* as in fig. 4. From dorsal aspect, tenth tergite (fig. 4B) emarginate, resultant dorsal lobes bearing several small spines distally; ventral lobe occupies most of tergite and very spinous. Tenth tergite from lateral aspect (fig. 4A) with dorso-distal corner of dorsal lobe bearing several small spines; ventral lobe with ventro-distal corner broadly rounded and spinous. From lateral view entire distal portion of tenth tergite appears covered with spines of variable shapes and sizes. Claspers extend beyond tenth tergite only a short distance, apex sub-truncate, baso-dorsal lobe short, digitate; lateral lobe longer, slender and parallel to clasper. Aedeagus tubular, apex sub-membraneous and bearing a pair of very large acuminate rods, shorter than aedeagus; large size and shape unusual for this group.

*Holotype* male, TWIN CREEK CAMP, BITTERROOT MOUNTAINS, SALMON, IDAHO, 5000' elevation, July 25, 1952, Borys Malkin. Paratype male, same data as for holotype.

*Lepidostoma astanea* Denning, new species

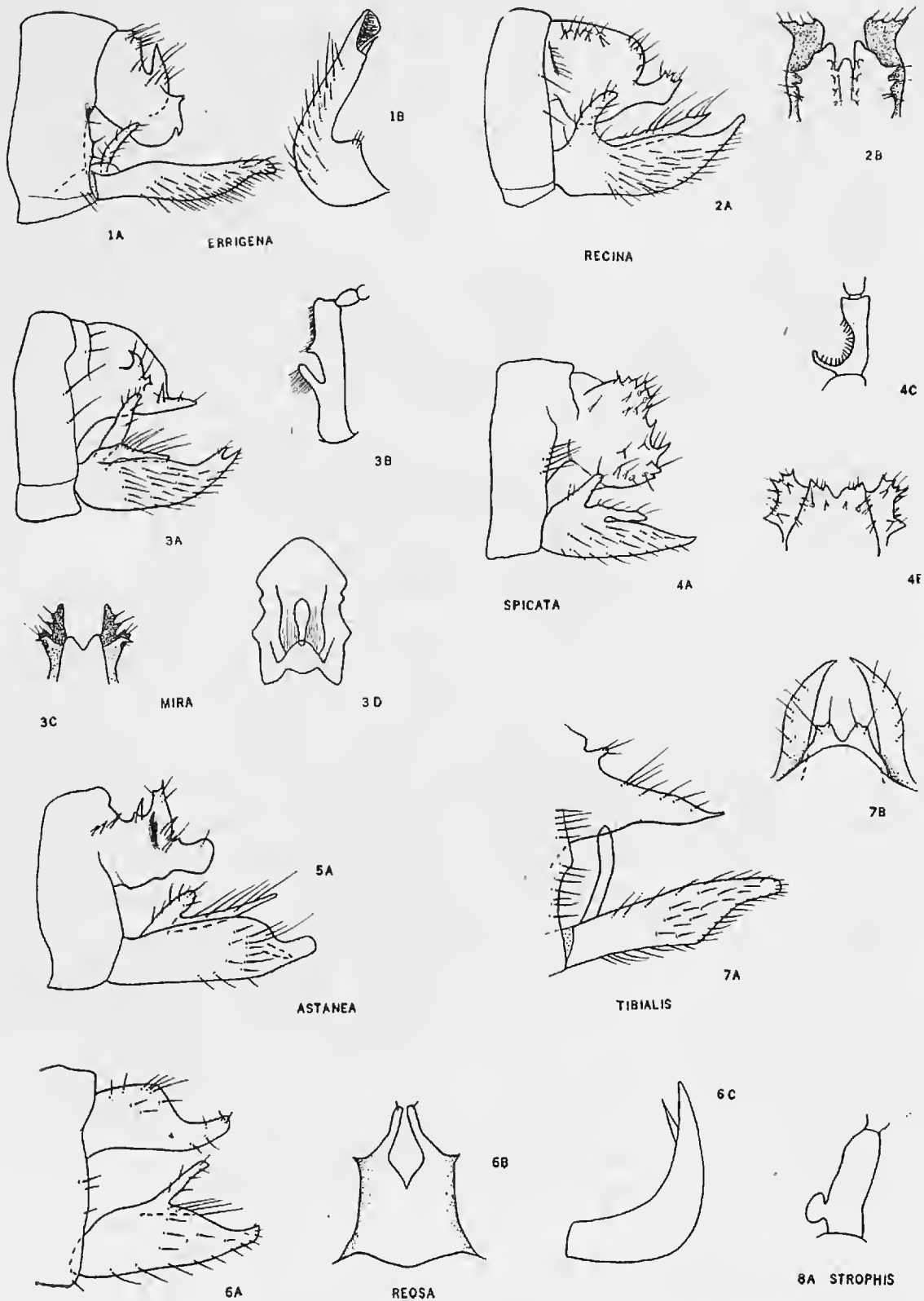
This species is a member of the *unicolor* group. Distinguishing characters are present in the tenth tergite with its prominent dorsal spine and elongated ventral lobe.

*Male*.—Length 7 mm. First antennal segment long and slender, otherwise not modified. Maxillary palpi apparently two segmented, directed dorsad to near margin of head, mesal surface bearing a dense brush of blackish scales and setae. About three-quarters of the costal cell of the front wing

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EXPLANATION OF FIGURES

Fig. 1. *Lepidostoma errigena*, male genitalia; 1A, lateral aspect; 1B, clasper, ventral aspect. Fig. 2. *Lepidostoma recina*, male genitalia; 2A, lateral



aspect; 2B, tenth tergite, dorsal aspect. Fig. 3. *Lepidostoma mira*, male and female genitalia; 3A, lateral aspect; 3B, basal segment antenna; 3C, tenth tergite dorsal aspect; 3D, spermatheca. Fig. 4. *Lepidostoma spicata*, male genitalia; 4A, lateral aspect; 4B, tenth tergite, dorsal aspect; 4C, second segment antenna. Fig. 5. *Lepidostoma astanea*, male genitalia; 5A, lateral aspect. Fig. 6. *Lepidostoma reosa*, male genitalia; 6A, lateral aspect; 6B, tenth tergite, dorsal aspect; 6C, clasper, ventral aspect. Fig. 7. *Lepidostoma tibialis*, male genitalia; 7A, lateral aspect; 7B, tenth tergite, dorsal aspect. Fig. 8. *Lepidostoma strophis*; basal segment antenna.

reflexed although resultant pocket is not wide, pocket filled with blackish scales. Spurs 2-4-4.

*Genitalia* as in fig. 5. Ninth segment annular, where it merges into tenth tergite there is a cluster of small spines. Tenth tergite from dorsal aspect with short emargination. From lateral aspect tenth tergite (fig. 5A) with apico-dorsal corner produced into an acute prominent dorsad directed spur, at base of which there is a cluster of spines which are very prominent from either dorsal or ventral view; ventral lobe produced caudad as a large obtuse process. Clasper slender throughout, abruptly constricted distally into a truncate apex; baso-dorsal lobe short, about one-third length of lateral lobe which is slender, acute and reaches nearly to apex of clasper; short, slender mesal process present near apex. Aedeagus with no accessory structures.

*Holotype* male, PATRICK CREEK, DEL NORTE COUNTY, CALIFORNIA, June 24, 1951, D. G. Denning.

#### TOGATUM GROUP

##### *Lepidostoma reosa* Denning, new species

This species is a member of the *togatum* group in which the tenth tergite is produced caudad into a pair of lateral arms. In this species, *reosa*, the claspers are not elongate as in *togatum*, *knowltoni*, *tibialis* and *carolina*, the only members of this group. Another character which quickly separates *reosa* is the dorsad curving rather than ventrad of the tenth tergite lateral arms.

*Male*.—Length 5 mm. General color brownish. Maxillary palpi apparently one segmented and erect. Wings, legs and antennae with no particular modifications.

*Genitalia* as in fig. 6. Tenth tergite, from lateral aspect, (fig. 6A) with dorsal margin arcuate; ventral lobe extended caudad as a slender dorsad-directed arm, apex obtuse and bearing two small spines. Tenth tergite, from dorsal aspect (fig. 6B) separated on meson nearly half the distance, the two lateral arms gradually convergent but not confluent; approximately midway, lateral margin produced into an acute angulation. Claspers short and robust, apex truncate; baso-dorsal process slender and directed dorso-caudad; from ventral aspect (fig. 6C) no basal angulation, near apex a short acute mesal process. Aedeagus with no accessory structures.

*Holotype* male, BELCHERTOWN, MASSACHUSETTS, May 21, 1938, (from University of Massachusetts Collection).

##### LEPIDOSTOMA TIBIALIS (Carpenter)

1947 *Lepidostoma rileyi* Denning, Ent. News, LVIII, No. 10:257 figs. 9, 10 (New synonymy).

Distinguishing characters are in the tenth tergite; the dorsal lobe is very short while the ventral lobe is produced caudad into a heavily sclerotized acute process, as seen from either the lateral aspect (fig. 7A) or dorsal aspect (fig. 7B). The species has been recorded only from North Carolina, Georgia and Tennessee,

Several collections of Trichoptera have yielded some very interesting distributional data of some species of *Lepidostoma*. They are as follows:

*Lepidostoma cascadensis* Milne.—This is a typically Western species. The following records extend the known range northward.

Yukon Territory: Alaska Highway, Mile Post 632, June 28, 1952, C. P. Alexander.

Alberta: Jasper, June 16, 1952, C. P. Alexander.

*Lepidostoma cantha* Ross.—Previously known only from Monterey and Contra Costa Counties, California. The present record extends the distribution to the southern part of the state.

California: Topanga Canyon, Los Angeles County, May 30, 1952, John Belkin; Pinnacles National Monument, Monterey Co., May 3, 1946, H. P. Chandler.

*Lepidostoma frosti* Milne.—Known distribution in the Northeast; New Hampshire, Massachusetts, Quebec and now Nova Scotia.

Nova Scotia: Cape Breton, Lake Bras D'or, July 4, 1951, C. P. Alexander.

*Lepidostoma hoodi* Ross.—Previously known only from Mt. Hood, Oregon and Nanaimo, B. C.

Washington: Mt. Rainier, Aug. 4, 1952, Vincent Roth.

*Lepidostoma ontario* Ross.—Eastern in distribution: Ontario, New Hampshire and Maine.

Nova Scotia; Cape Breton, Victoria Co., July 1, 1951, C. P. Alexander.

*Lepidostoma podager* (McL.).—Definite records have been available only from California. The following record extends the species into the Rocky Mountain area.

Wyoming: Madison Jct., Yellowstone Natl. Park, July 6, 1946, Marion E. Smith.

*Lepidostoma quercina* Ross.—Until now recorded only from Oregon and Idaho.

Washington: Kusch Creek, near Goldendale, May 29, 1952, D. G. Denning.

*Lepidostoma querla* Denning.—Previously record only from type locality, Oak Creek Canyon, Arizona.

Arizona: Diamond Creek, White Mts., June 20, 1950, R. H. Beamer.

*Lepidostoma roafi* (Milne).—Well distributed in the western half of the country. The following are new northern records.

Yukon Territory: Alaska Highway, Mile Post 632, June 28, 1952, C. P. Alexander. Alberta: Banff, Aug. 14, 1949, C. P. Alexander.

*Lepidostoma swannanoa* Ross.—Eastern in distribution: New Hampshire, New York, North Carolina and now Massachusetts.

Massachusetts: Amherst, June 9, 1941, Marion E. Smith.

*Lepidostoma strophis* Ross.—Transcontinental and well dis-

tributed through the West, but unrecorded from Idaho. The first antennal segment, with the peculiar knob along the mesal surface near the base of the segment, is illustrated in fig. 8A.

Idaho: Lewiston, May 25, 1952, D. G. Denning.

*Lepidostoma togatum* (Hagen).—Distributed through the eastern half of the country. The Alberta record extends the known range northwestward.

Alberta: Wahamum, July 13, 1939, E. H. Strickland. Nova Scotia: Halifax Co., near Ecum Secum, June 29, 1951, C. P. Alexander; Inverness Co., Margaree River, July 3, 1951, C. P. Alexander.

*Lepidostoma unicolor* (Banks).—Widely distributed from Minnesota to the Pacific Coast and northward into Saskatchewan. Now known to occur in the Southwest.

Arizona: Big Creek, Graham Mts., Graham County, Aug. 19, 1952, Hugh Leech. California: Tanbark Flats, Los Angeles County, July 2, 10, 26, 1952, A. T. McClay.

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#### ANOTHER WEEVIL INJURIOUS TO STRAWBERRIES

On July 11 of 1953 the author was called to examine a field of strawberries near Hillsboro, Oregon, that had been severely injured by weevil larvae. The larvae had eaten into the crowns of the plants and killed many of them. The injury was so severe that the grower later plowed up the field. This weevil may become quite injurious if it spreads to other strawberry growing districts. Adult weevils were found feeding on the edges of the leaves and resting under the foliage. They were identified by Miss Rose E. Warner of the National Museum as *Peritelinus oregonus* Van Dyke. In a personal letter, C. F. W. Muesbeck stated that *P. oregonus* had been taken on filbert leaves in Oregon and on *Achillea lanulosa*. This is the first time it has been recorded on strawberries.

The original description by Van Dyke<sup>1</sup> states that the type series was collected on oak, *Quercus Garryana* at Corvallis on June 3, 1914. He also mentioned specimens from Klamath Falls, Oregon, collected on July 9, 1934. There are other Oregon records from Salem, Dallas and Alsea Mountain. The seasonal dates of collection of the adults range from April 27 to July 11.—R. G. ROSENSTIEL, *Oregon State College, Corvallis*.

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<sup>1</sup> Van Dyke, Edwin C. 1936. New species of North American weevils in the family Curculionidae, subfamily Brachyrhininae, V. Pan-Pacific Entomologist, 12 (1) : 19-32.